

## Notes on an Autumn Roost of an Eastern Small-footed Bat (*Myotis leibii*)

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### ABSTRACT

*Myotis leibii* is a rarely encountered bat, with most records obtained during hibernation. A specimen was found in late September roosting in a rock crevice on a forested hillside along the Virginia-West Virginia border.

**Key words:** bat, Chiroptera, *Myotis leibii*, roosting behavior.

The eastern small-footed bat (*Myotis leibii*) is the smallest bat in the eastern United States, weighing as little as 3-4 g (Harvey, 1992). The species ranges from eastern Canada and New England south to Georgia and west to Oklahoma, and is considered relatively rare throughout its range (Harvey, 1992). Choate et al. (1994) stated that it is "considered one of the rarest species of bats in the eastern United States." It was formerly regarded as a candidate for listing as a federally endangered or threatened species (U.S. Fish and Wildlife Service, 1994).

*Myotis leibii* was first reported from Virginia by Johnson (1950), who cited records for two caves in Bath and Highland counties. Relatively few additional records were added during the subsequent half-century. Handley (1979, 1991) reported that *M. leibii* is uncommon in Virginia, but does not warrant threatened or endangered status in the state. The range map in Linzey (1998) suggests that the species is widespread in western Virginia, but there are confirmed records from only 13 counties, ranging from Augusta, Bath, and Highland in the north to Dickenson, Wise, Scott, and Lee in the south (Hobson, 1998; Virginia Department of Game and Inland Fisheries, 2002). There are 24 current or historical sites for *M. leibii* in the Division of Natural Heritage database. The species was collected twice in 1907 on Plummer's Island, Montgomery County, Maryland (Bailey, 1946), but it has not been recorded from the Virginia shoreline of the Potomac River (Hobson, 2001). Feldhamer et al. (1984) plotted five locality records for *M. leibii* in western Maryland (where the species is listed as state threatened), but only

a handful of individuals were found during cave surveys in the region (Gates et al., 1984). *Myotis leibii* has been recorded from nine counties in eastern West Virginia, four of which border Virginia (West Virginia Department of Natural Resources, 1987). Stihler (2000, 2003) reported that only a few West Virginia caves harbor more than five *M. leibii* during winter and noted that "limited research" revealed the species roosts in rock outcrops in summer. Despite records of *M. leibii* in northeastern West Virginia and western Maryland, there are no confirmed records of this species from northwestern Virginia (i.e., north of Augusta and Highland counties).

Most Virginia records of *M. leibii* have been obtained in caves or near cave entrances (Handley, 1979; Dalton, 1987; Hobson, 1998). Dalton (1987) found *M. leibii* in only 16 of 106 (15%) Virginia caves inhabited by bats. The species was recorded in caves in 10 counties, but represented <1% of the total number of bats observed during her surveys. Hobson (1998) obtained 11 summer records of *M. leibii* at five sites in far southwestern Virginia during mist net sampling.

Throughout the range of *M. leibii* most records are of hibernating individuals with only a few summer observations reported (Hitchcock, 1955; Barbour & Davis, 1969; Hall, 1985). The species is usually solitary and commonly roosts in cracks, fissures, and crevices, sometimes beneath rocks on cave floors or on the ground (Davis, 1955; Krutzsch, 1966; Barbour & Davis, 1969, 1974; Choate et al., 1994). Barbour & Davis (1974) found *M. leibii* under rocks on a hillside as well as in a quarry. The species has also been found

in hollow trees, buildings, and expansion joints beneath highway bridges (Hitchcock, 1955; Barbour & Davis, 1974; Harvey, 1992). Webster et al. (1985) stated that the habitats occupied by *M. leibii* in the Appalachian Mountains are poorly known, but that “roosts usually are found in hemlock forests.”

At approximately 1145 h on 26 September 2002, I found a *M. leibii* (presumably an adult) in a small, hillside boulder field (Fig. 1) in the Bother Knob area of Shenandoah Mountain along the Virginia-West Virginia border (George Washington National Forest). The bat was resting (possibly sleeping) in the crevice-like space between two large rocks (Fig. 2). The upper rock had a maximum dimension of approximately 40 cm (16 in) and was about 5 cm (2 in) thick. The bat was in a huddled, horizontal position on the topside of the lower rock (Fig. 3). Upon disturbance, it began crawling and attempted to fly weakly before entering a



Fig. 1. Boulder field where diurnally-roosting specimen of *Myotis leibii* was found on Bother Knob, Shenandoah Mountain. The bat was located beneath the rock indicated by the arrow.



Fig. 2. Lateral view of rock crevice inhabited by *Myotis leibii*. The bat occupied the space between the upper and lower rocks.



Fig. 3. Dorsolateral view of resting *Myotis leibii* immediately after removal of the cover rock.

nearby rock crevice. Air temperature was approximately 15 °C (59 °F), skies were mostly overcast, and light rain was falling. The forest was dominated by northern hardwoods and the canopy above the site was partially open.

My observations were made at an elevation of approximately 1300 m (4260 ft) on the southwest-facing slope of Bother Knob in Pendleton County, West Virginia, within 100 m of the Virginia (Rockingham County) state line. Bother Knob is ca. 20 km (12.5 mi) north and 40 km (25 mi) northeast of the nearest documented sites for *M. leibii* in Augusta and Highland counties, respectively. Stihler (2001) reported this species from 11 caves in Pendleton County ( $\leq 4$  *M. leibii* per cave). Additional surveys in the vicinity of Bother Knob, using a variety of sampling methods including mist nets, as well as elsewhere along Shenandoah Mountain (including nearby Reddish Knob), are warranted to learn more about the status and distribution of this poorly-known species. Surveys at or near boulder fields throughout western Virginia may support the assumption that *M. leibii* is more common in the state than is currently documented.

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